PB-216 844

A COMPREHENSIVE WATER POLLUTION CONTROL PROGRAM FOR THE HUMBOLDT RIVER AND CENTRAL NEVADA BASINS

Public Health Service
San Francisco, California

1953

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U. S. DEPARTMENT OF COMMERCE
5285 Port Royal Road, Springfield Va. 22151

TD420
.U58
no. 52

PB 216 844

Water Pollution Series, No. 52

A COMPREHENSIVE PROGRAM FOR WATER POLLUTION CONTROL

for the

Humboldt River and Central Nevada Basins

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U. S. Department of Health, Education, and Welfare
Public Health Service

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for the

Humboldt River and Central Nevada Basins

Developed by the Nevada State Department of Health

1953

adopted by

U. S. DEPARTMENT OF
HEALTH, EDUCATION, AND WELFARE
Public Health Service

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Public Health Service Publication No. 294

WASHINGTON: 1953

FOREWORD

Our country's development over the past 50 years has been marked by tremendous progress in many fields. It has made possible great gains in the health, comfort, and well-being of the people. But it has not been without cost. Part of the cost has been the damage to the Nation's water resources that has resulted from wastes discharged to the streams by our growing cities and industries. All water uses have been affected--public water supplies, recreation, agriculture, industry, fish and aquatic life.

In enacting the Federal Water Pollution Control Act in 1948, the Congress declared that "water pollution has become a matter of grave concern in many areas and its damaging effects on the public health and national resources are a matter of definite Federal concern as a menace to national welfare. Abatement must be undertaken in order to control it."

The Public Health Service, as part of its responsibilities under this Act, is required to prepare or adopt, in cooperation with other Federal agencies, State and interstate water pollution control agencies, and municipalities and industries, comprehensive programs for the abatement of pollution.

This publication summarizes the "COMPREHENSIVE WATER POLLUTION CONTROL PROGRAM FOR THE HUMBOLDT RIVER AND CENTRAL NEVADA BASINS," developed by the Nevada State Health Department, Division of Public Health Engineering. The program is sound and gives full consideration to the several present uses and to the reasonably-anticipated future uses of the waters of the Humboldt River and Central Nevada Basins. It provides an equitable balance in the pollution control requirements for the various private and public groups concerned.

I am pleased, therefore, in my capacity as Surgeon General of the Public Health Service, to adopt the program developed by the Nevada State Health Department, Division of Public Health Engineering, for the Humboldt River and Central Nevada Basins, as a comprehensive program which fully meets the requirements of the Federal Water Pollution Control Act.

This program is based on beneficial water uses and related conditions that prevailed in June, 1952. Comprehensive programs for pollution control must necessarily be flexible. They must allow for growth, development, and changing conditions. Any significant changes affecting water quality, such as stream flow, water use, industrial development, population, etc., may require changes in the pollution control program.

Obviously the mere adoption of this program will not, in itself, reduce pollution or improve the usefulness of the waters in the Humboldt River and Central Nevada Basins. It does provide to the citizens of the area and to the city officials and industrial leaders, farmers, fishermen, conservationists, and others an objective plan based on good engineering practice, and reflecting sound economics. It is a plan which the public can support, and must support, if progress is to be made in the abatement of pollution.

Certain additional considerations beyond the mere acceptance of a plan are essential to its successful execution. The citizens of the areas affected must see that sufficient resources are provided to the State water pollution control agencies concerned to enable them to make the technical investigations necessary to aid those responsible for constructing pollution abatement works.

Above all, no program of this nature can progress beyond the report stage if its meaning and purpose are not made clear and understandable to the citizens of the area. In the

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final analysis they are the ones who will pay, directly or indirectly, for the pollution abatement works that are needed.

It is my hope that this program for the Humboldt River and Central Nevada Basins will be carried through to completion so that the area may enjoy all the benefits that clean water can provide, in health and recreational opportunities for the people and in sound growth of industry and agriculture.

Leonard A. Scheele

Leonard A. Scheele,
Surgeon General

INTRODUCTION

This comprehensive program for pollution control in the Humboldt River and Central Nevada Basins is based upon two reports--"Report on Water Pollution Control, Humboldt River Basin," June 1952, and "Report on Water Pollution Control, Central Nevada Basin," June 1952--which contain detailed supporting data for the program. These supporting reports, which have been made available to city and State officials and other Federal agencies, were prepared jointly by the Nevada State Health Department, Division of Public Health Engineering, and the U. S. Department of Health, Education, and Welfare, Public Health Service, Division of Water Pollution Control, California and Great Basin Drainage Basins Office.

To evaluate the water pollution problems of the Humboldt and Central Nevada Basins, representatives of the Division of Public Health Engineering, Nevada State Department of Health, with the cooperation of the California and Great Basin Drainage Basins Office of the Public Health Service, made a comprehensive sanitary survey of the region in 1951 and 1952. Representatives of these agencies also consulted local groups to evaluate present and foreseeable future water uses in these basins. These uses were reviewed with the Nevada State Engineer and the Nevada State Fish and Game Commission.

As a result of these field investigations the two aforesaid reports were released. These reports based on data available as of June 1952 embody a comprehensive plan for water pollution control and include a consideration of present water uses and water quality, sources of pollution, damages to water resources and remedial measures necessary to protect extremely limited water resources of these basins.

It should be emphasized that this pollution control program is keyed to the beneficial water uses and related conditions that prevailed in June 1952. Any significant changes in these conditions related to water quality--as stream flow, water use, industrial development, population--may necessitate changes in the pollution control program.

The assistance provided by municipal, State and Federal authorities, by industry, and by water users is acknowledged with appreciation.

HUMBOLDT RIVER AND CENTRAL NEVADA BASINS
GENERAL REFERENCE MAP
U.S. DEPT. OF HEALTH, EDUCATION, & WELFARE
Public Health Service
Division of Water Pollution Control

GENERAL DESCRIPTION OF BASINS

The Humboldt River and Central Nevada Basins include an area of approximately 52,400 square miles in arid north and south-central Nevada. The total population is approximately 24,600, 60 percent of which resides in the Humboldt River Valley.

Climatologically, the area is characterized by low rainfall (10 to 20 inches per year), wide extremes of temperature, low wind velocities, ample sunshine, low relative humidity, high evaporation rate, and in the northern and mountainous sections, a relatively short growing season.

Irrigated agriculture, stock raising, and mining are the most important economic activities. In 1945, there were about 850 farms with 446,000 acres under some type of irrigation. The farms, together with stock and equipment, were valued at 39.8 million dollars, while the farm and livestock products were marketed for 11.27 million dollars. Mineral production in 1944 was valued at over 3.5 million dollars.

The Humboldt River, the Basins' only major stream, originates in the mountains in the northeastern quarter and flows about 600 miles, in a southwesterly direction to terminate in the Humboldt Sink. The difference in elevation from the headwater to the sink is about 1,090 feet. The average flow is about 366 second-feet;[1] however, during late summer, extremely low, or zero, flows are common over the length of the river. The remainder of the Basins consists of many small closed valleys with no important watercourses and hence very limited water resources.

The surface waters are generally satisfactory for the principal beneficial uses--irrigation, livestock watering, and fish and wildlife production. However, without treatment, the surface waters are not suitable for domestic use or for process water by existing industry, and with one exception--Lamoille, population 50--no community or industrial water supplies are derived from streams. Spring sources are used at a number of places to supplement well supplies. The quality of the ground water is satisfactory for domestic use, and for the flotation processes in the mineral processing industries. There is no evidence of ground water pollution.

The economy, largely agricultural, is geared primarily to livestock raising and the production of hay for winter feeding of livestock. Because of the physical characteristics of the area and the large size of individual land holdings, the primary use of surface water for the present and foreseeable future is for agriculture--irrigation and livestock watering.

Due to migratory runs of trout in the south fork of the Humboldt River and Star Creek, that section of the Humboldt River above Battle Mountain is considered an important trout producing area. A sanitary survey has shown that sewage pollution from Elko at times has reduced the dissolved oxygen content of the Humboldt River to less than 1.1 p.p.m. --considerably below the six parts per million objective of the Nevada State authorities to support trout. Bass, catfish, and a few trout are found downstream from Battle Mountain. Other small streams are of only limited importance from the fisheries standpoint. The Humboldt Sink is an important water fowl refuge. Swimming and water sports are of minor importance.

[1] Palisade, 39-year period.

SOURCES OF POLLUTION

Ten communities, seven of which are in the Humboldt River Basin, are significant sources of pollution. The Humboldt River receives the wastes of three communities: Elko, population 5,389; Carlin, population 1,198; and Winnemucca, population 2,816; and in periods of high water the wastes from Battle Mountain, population 735. Elko, Carlin and Winnemucca provide primary treatment, whereas Battle Mountain provides secondary treatment. Five other sewered communities--Wells, Austin, Lovelock, Tonopah, and Goldfield, discharge wastes to land. The tenth community, Eureka, has no community sewage system. Industrial waste from the four principal industries--Getchell Mining Co., Nevada-Massachusetts Inc., Copper Canyon Mining Co., and Natomas Co.--is being satisfactorily controlled by disposal to land.

Sewage disposal problems are primarily those of local nuisance and health hazards associated with the disposal of raw sewage on land and those resulting from unsatisfactory individual household systems.

The principal effect of sewage discharged into the Humboldt River at Elko, Carlin, and Winnemucca is to lower the dissolved oxygen content of the water to a point which endangers fish and aquatic life. Sewage discharged at Elko has at times reduced the dissolved oxygen content of the Humboldt River to less than 1.1 p.p.m. The Nevada Fish and Game Commission has recommended that a minimum of six p.p.m. dissolved oxygen be maintained in the Humboldt River, and other fishing streams.

POLLUTION CONTROL PROGRAM

To eliminate public health hazards and local nuisance conditions, and to assure satisfactory water quality for the principal beneficial uses--irrigation, livestock watering, maintenance of fish and wildlife--this comprehensive program for the control of water pollution has been developed by the Nevada State Department of Health, Division of Public Health Engineering. The program is in keeping with the State policy of requiring at least primary treatment for all domestic sewage discharges.

Measures for Control of Municipal Wastes

1. Elko should replace the existing primary treatment plant and provide secondary treatment for its wastes. With this degree of treatment and satisfactory operation of the plant, effluent may be discharged to the Humboldt River. Elko has engaged an engineering firm to evaluate its sewage treatment needs, and to prepare plans and cost estimates. The contract for construction of this plant has been awarded, and actual construction should be completed during 1953.

2. Carlin may continue to discharge effluent from its primary treatment plant into the Humboldt River as long as sufficient dilution water is available to maintain a minimum dissolved oxygen content of six p.p.m. in the river.

3. Battle Mountain may continue to discharge effluent from its existing oxidation ponds to the low areas adjacent to the Humboldt River. This effluent reaches the river only during periods of high runoff. Additional ponds under construction should be completed and placed in operation for more efficient treatment of the effluent. The effluent drain ditch and the disposal area should be properly maintained to prevent odor nuisances and mosquito breeding.

4. Winnemucca may continue to discharge effluent from its primary treatment plant into the Humboldt River so long as sufficient dilution water is available to maintain a minimum dissolved oxygen content of six parts per million in the river. This plant is now being studied to determine possible methods of enlargement and modernization.

5. Wells should provide primary treatment of domestic wastes followed by controlled land disposal of effluent.

6. Austin should provide primary treatment of domestic wastes followed by controlled land disposal of effluent.

7. Lovelock should place the newly constructed Imhoff tank in operation. Discharge of treated sewage to the Humboldt Sink should be controlled so that it will not cause nuisance conditions or public health hazards.

8. Eureka should install an adequate collection system and provide primary treatment of domestic wastes followed by controlled land disposal of effluent.

9. Tonopah should provide primary treatment of domestic wastes followed by controlled land disposal of effluent.

10. Goldfield should provide primary treatment of domestic wastes followed by controlled land disposal of effluent.

11. Sewage treatment plants should be maintained and operated so that the maximum treatment capabilities of the plants will be realized.

Measures for Control of Industrial Wastes

There are no industries within the basins that are significant sources of pollution. Any new industrial developments should comply with the current plan for the control of industrial wastes, and should, of course, also comply with any new pollution control regulations that may be adopted. The current plan for the control of industrial wastes involves five general measures:

(a) Determination of the quality and quantity of wastes;

(b) Evaluation of damage that may occur to surface and/or ground water;

(c) Reduction in the quantity and strength of wastes by good plant housekeeping;

(d) Satisfactory treatment of remaining waste;

(e) Approval of plans and specifications for treatment works by the Division of Public Health Engineering of the Nevada State Department of Health.

The specific pollution prevention measures of the foregoing action program shall be undertaken by the respective communities and industries as soon as practicable.

The needed projects and estimates of their costs are summarized in the following table.

Municipal sewage treatment needs for pollution abatement -- 1952

Community	Population (1950)	Estimated population equivalent of wastes		Wastes discharged to --	Existing treatment facilities	Project requirement	Estimated costs 2/
		Raw 1/	Treated				
Elko	5,389	6,400	5,000	Humboldt River	Primary	Replace with secondary treatment	3/$275,000
Carlin	1,198	1,400	1,000	----do	----do	None	---
Battle Mountain	735	850	300	----do 4/	Secondary	----do	---
Winnemucca	2,816	3,300	2,000	----do	Primary	----do	---
Wells	939	1,200	---	Land	None	Primary treatment with controlled land disposal of effluent.	40,000
Austin	406	500	---	----do	----do	----do	18,000
Lovelock	1,613	1,900	---	----do	Primary	Place existing plant in operation.	---
Eureka	543	600	---	----do 5/	None	a. Collection system. b. Primary treatment, with controlled land disposal of effluent.	19,000 21,000
Tonopah	1,360	1,600	---	----do	----do	Primary treatment with controlled land disposal of effluent.	54,000
Goldfield	329	370	---	----do	----do	----do	14,000
	15,328	18,120					$441,000

1/ Includes industrial wastes discharged into city sewers.
2/ Estimates based upon average cost data for communities this size (except Elko).
3/ Consulting engineers' estimate.
4/ To river only during flood periods.
5/ No sewer system. Septic tanks and cesspools used.

U. S. GOVERNMENT PRINTING OFFICE : 1953 O—275485